

REMARKS

The Office Action dated June 27, 2006 has been received and noted. Claims 8-11, 18-19 and 24 were examined. Claims 8-11, 18-19 and 24 were rejected. No amendments are made. Accordingly, claims 8-11, 18-19 and 24 remain in the Application. Reconsideration is requested in view of the following remarks.

I. Claims Rejected Under 35 U.S.C. § 102

Claim 8 was rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,587,882 to Patel (“*Patel*”). A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP § 2131. Applicant respectfully submits that each and every element in claim 8 is not set forth in the cited reference.

Claim 8 includes the limitation of “a *flexible* material in contact with the surface of the heat spreader and the package substrate, the flexible material defining a perimeter of a cavity.” Representatively, the flexible bond may help to compensate for differing coefficients of thermal expansion (CTE) between the heat spreader and the substrate, resulting in a more consistent heat conduction pathway. (App., p.11-12, ¶ 2) By contrast, *Patel* describes a thermal interface between chips 49 and a heat sink 40. (col. 4, lns. 16-17) An adhesive 41 forms an interface between heat sink 40 and substrate 44, which “[b]ecause the [thermal coefficient of expansion] of the substrate 44 and the TCE of the heat sink 40 are matched, the adhesive 41 used to fill the trough 43 may be rigid, such as epoxy or resin.” (col. 5, lns. 1-4; FIG. 4). Thus, *Patel* does not disclose adhesive 41 as flexible, but rather the exact opposite, or rigid. Accordingly, *Patel* does not disclose each and every element of claim 8. In view thereof, Applicant respectfully submits that claim 8 is allowable over the cited reference.

II. Claims Rejected Under 35 U.S.C. § 103

A.

Claims 9-10 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Patel* in further view of U.S. Pat. No. 5,931,222 to Toy et al. (“*Toy*”). In order to establish a *prima facie* case of obviousness: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference; (2) there must be a reasonable expectation of success; and (3) the references when combined must teach or suggest all of the claim limitations. MPEP § 2142. Applicants respectfully submit that a *prima facie* case of obviousness has not been established.

More particularly, there is no motivation to combine the cited references to teach independent claim 8 and the references have therefore been improperly combined. As stated previously, claim 8 includes the limitation of “a *flexible* material in contact with the surface of the heat spreader and the package substrate, the flexible material defining a perimeter of a cavity.” By contrast, *Patel* describes a thermal interface between chips 49 and a heat sink 40. (col. 4, Ins. 16-17) An adhesive 41 forms an interface between heat sink 40 and substrate 44, which “[b]ecause the [thermal coefficient of expansion] of the substrate 44 and the TCE of the heat sink 40 are matched, the adhesive 41 used to fill the trough 43 may be rigid, such as epoxy or resin.” (col. 5, Ins. 1-4; FIG. 4). Thus, *Patel* does not teach that adhesive 41 is flexible, but rather the exact opposite, that adhesive 41 is rigid. *Toy* teaches a nickel-plated cap 18 fixedly bonded to a layer of silicone elastomeric material 21. (col. 6, Ins. 24-26) It is known by those skilled in the art that silicone elastomeric material is a flexible material. Accordingly, *Toy* teaches away from *Patel* and renders *Patel* unsatisfactory for its intended purpose; the references cannot therefore be combined. Dependent claims 9-10 and 24 include all of the limitations of independent claim 8. Applicant respectfully submits that claims 9-10 and 24 are allowable over the cited references.

B.

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Patel* in view of U.S. Pat. No. 6,091,603 to Daves et al. (“*Daves*”). Applicant submits there is no motivation to

combine the cited references to teach independent claim 8 and the references have therefore been improperly combined. As stated previously, claim 8 includes the limitation of “a *flexible* material in contact with the surface of the heat spreader and the package substrate, the flexible material defining a perimeter of a cavity.” By contrast, *Patel* describes a thermal interface between chips 49 and a heat sink 40. (col. 4, lns. 16-17) An adhesive 41 forms an interface between heat sink 40 and substrate 44, which “[b]ecause the [thermal coefficient of expansion] of the substrate 44 and the TCE of the heat sink 40 are matched, the adhesive 41 used to fill the trough 43 may be rigid, such as epoxy or resin.” (col. 5, lns. 1-4; FIG. 4). Thus, *Patel* does not teach that adhesive 41 is flexible, but rather the exact opposite, that adhesive 41 is rigid. *Daves* teaches that lid member 101 may be “metallized.” (col. 4, lns. 44-48) Lid member 101 may be sealed to substrate 500 using “sealing material 400 . . . such as a resin (e.g., epoxy or silicone) or solder or a mechanical seal.” (col. 6, lns. 29-31) Similar to *Patel*, *Daves* does not teach that adhesive 41 is flexible, but rather the exact opposite, that adhesive 41 is rigid. Thus, the references when combined teach away from independent claim 8. Dependent claim 11 depends on independent claim 8 and therefore includes all of its limitations. Applicant respectfully submits that claim 11 is allowable over the cited references.

C.

Claims 18-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Patel* in further view of *Toy*. Applicant submits there is no motivation to combine the cited references to teach independent claim 18 and the references have therefore been improperly combined. Independent claim 18 includes the limitation of “a cover coupled to the surface of the substrate through a *flexible* sealant material.” As discussed in detail above, *Toy* teaches away from *Patel* and renders *Patel* unsatisfactory for its intended purpose; the references cannot therefore be combined. Dependent claim 19 depends on independent claim 18 and therefore includes all of its limitations. Applicant respectfully submits that independent claim 18 and its respective dependent claim are allowable over the cited references.

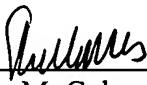
CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

Respectfully submitted,

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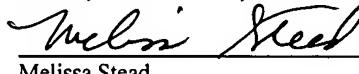
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